



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/603,147

06/23/2000

John T. Moore

MI22-1443

3541

21567

7590

03/23/2005

WELLS ST. JOHN P.S.

601 W. FIRST AVENUE, SUITE 1300
SPOKANE, WA 99201

EXAMINER

KIELIN, ERIK J

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 03/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/603,147	MOORE ET AL.	
	Examiner	Art Unit	
	Erik Kielin	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 76,81,97 and 98 is/are pending in the application.
- 4a) Of the above claim(s) none is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 76,81,97 and 98 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>7/1/04 2/1/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on 1 July 2004 have been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 76, 81, 97, and 98 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The instant specification fails to provide support for forming a layer “consisting essentially of a material having silicon, oxygen, and from about 2% to 20% carbon, by weight.”

Reasoning is as follows:

In the Response filed 16 January 2004, Applicant presents the argument,

“Yau discloses utilization of oxidized organo-silane layers. Yau further discloses that the carbon content of such films can be from 1-50%, by weight (col. 4, ll. 54-59). Yau additionally indicates that the carbon is preferably included in an alkyl group such as methyl or ethyl (col. 4, ll. 54-59).”

Art Unit: 2813

41-44). **Nowhere does Yau indicate or suggest utilization of materials other than hydrogen-containing materials.** Accordingly, Yau does not disclose or suggest the recited carbon containing sidewall spacers **consisting essentially of silicon, oxygen, and carbon.**" (Response filed 16 January 2004, p. 5, first full paragraph. Emphasis added.)

Accordingly, Applicant argues that Yau cannot produce a film "consisting essentially of a material having silicon, oxygen, and from about 2% to 20% carbon, by weight" because Yau is using only hydrogen-containing precursor materials. Similarly however, **the instant specification states,**

"The carbon can be introduced in the form of a carbon-containing deposition (CVD) of gas provided as a precursor during chemical vapor the material within which carbon is desired. Such carbon-containing gas can comprise, for example, one or more of **tetraethylorthosilicate (TEOS), bis-tertiary butyl aminosilane (BTBAS), methane,** carbon dioxide, or carbon tetrachloride. In an exemplary application wherein carbon is incorporated into silicon nitride, the silicon nitride can be formed by chemical vapor deposition utilizing **dichlorosilane and ammonia,** at a temperature of from about 300 °C to about 750 °C and a pressure of from about 50 mTorr to about 2 Torr, and in the presence of an above-discussed carbon-containing gas." (Instant specification, paragraph bridging pages 13-14. Emphasis added.)

Each of the highlighted precursors contain **hydrogen**. As a matter of fact, the instant specification provides absolutely **no** precursor materials which contain silicon that are absent hydrogen. By Applicant's own arguments of record, then, the instant disclosure is not enabled because the instant specification has failed to provide a means for eliminating hydrogen in the film "consisting essentially of a material having silicon, oxygen, and from about 2% to 20% carbon, by weight" since all of the precursors used have hydrogen.

As further evidence, the instant specification states the following,

Art Unit: 2813

“An etch stop layer 132 is formed over substrate 112 and over wordlines 120 and 122. In accordance with an aspect of the present invention etch stop layer 132 has carbon incorporated therein. Etch stop layer 132 can comprise, for example, silicon oxide or silicon nitride, and **can consist essentially of silicon, nitrogen and carbon, or can consist essential of silicon, oxygen and carbon.** For purposes of the discussion that follows, etch stop layer 132 will be referred to as a silicon nitride layer. Portions 115 of nitride layer 132 extend along sidewall spacers 128 and 130. Silicon nitride layer 132 can be formed to a thickness of less than or equal to about 500Å, and can be formed by, for example, chemical vapor deposition of silicon nitride in the presence of **BTBAS**. Specifically, silicon nitride layer 132 can be deposited in a chemical vapor deposition reactor having a pressure of from about 50 mTorr to about 10 Torr, a temperature of from about 575 C to about 750 C, a flow rate of SiH_4 of from about 0 to about 500 sccm, a flow rate of NH_3 of from about 0 to about 2000 sccm, 500 sccm, to form to about 20% carbon and a flow rate of **BTBAS** of from about 0 to about silicon nitride layer 132 having from about 2% incorporated (by weight).” (Instant specification, paragraph bridging pages 17-18. Emphasis added.)

Again, **only hydrogen-containing precursors are used** to form specifically a material

“**consisting essentially of silicon, nitrogen, and carbon, or silicon, oxygen, and carbon**” but, as argued by Applicant in the response, **no** hydrogen, because hydrogen-containing precursors are used. Applicant clearly contradicts the instant specification by arguing that the Yau etch stop material cannot consist essentially of silicon, oxygen, and carbon, because hydrogen-containing precursors are used, when the instant specification points out a specific example which forms a material “consisting essentially of silicon, nitrogen, and carbon, or silicon, oxygen, and carbon” by using expressly **only hydrogen-containing precursors**. Accordingly, Applicant argues that his own specification fails the written description requirement for failing to provide a means for making the claimed material: a material “consisting essentially of silicon, oxygen, and from about 2% to about 20% carbon, by weight” because only hydrogen-containing precursors are used.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 76, 81, 97, and 98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art (AAPA) in view of US 6,136,700 (McAnally et al.) and US 6,054,379 (Yau et al.).

Regarding independent claim 76, AAPA clearly discloses each of the features of the DRAM including a semiconductor substrate 12, the three nodes 14, 16, 18 in gated electrical connection via wordlines 20, 22 with sidewalls 28, 30 (i.e. the wordlines are the conductive gates controlling the connection between the capacitors and the storage nodes); capacitor constructions 36, 38 formed in the openings of and directly against the insulating layer 34 --which may be BPSG as further limited by instant claim 98-- and directly against the substrate 12; bit line contact 46; the etch stop 32 formed over, along, and proximate the wordlines and extending along and against a portion of the storage node (first electrode 40). Each capacitor construction comprises a storage node (first electrode) 40 formed of conductively doped polysilicon (specification, p. 4, lines 16-18), dielectric 42, and second electrode 44. (See Prior Art Figures 1-4 and specification, section entitled, Background of Invention" -- especially pp. 5-8. Compare especially AAPA prior art Fig. 1 with non-prior art Fig. 7.)

The **AAPA** is silent to (1) the sidewall spacer material consisting essentially of a material having carbon, silicon, and oxygen and (2) the insulating layer being in contact with at least one of the carbon-containing sidewall spacers.

Regarding (1), **McAnally** teaches forming either or both the sidewall spacers **108** and etch stop **110** from the aforementioned composition containing carbon, silicon, and oxygen and can comprise silicon carbide --as further limited by instant claim 81-- to improve etch selectivity specifically for etching a storage node contact. Regarding (2) **McAnally** teaches that the etch stop layer **110** may be omitted because the sidewall spacers are made of the etch-resistant carbon-containing material and that this beneficially eliminates an etch step. (See Abstract; col. 3, lines 37-40; claim 3; col. 5, lines 10-43; col. 6, lines 25-31.)

It would have been obvious to one of ordinary skill at the time of the invention was made to use the sidewall spacer material of **McAnally** for the sidewall spacer material of **AAPA** for the reasons indicated in **McAnally** --especially to protect to the gate structure from being damaged during etching of the opening for the storage node contact. It would be obvious to have the insulative material **34** of **AAPA** directly contacting one of the sidewall spacers (i.e. omitting the etch stop layer **32**) to beneficially reduce the number of etch steps, as taught to be beneficial in **McAnally**.

Then the only difference is that neither **AAPA** nor **McAnally** indicates the amount of carbon in the sidewall spacers to be "from about 2% to about 20% carbon."

Yau teaches an etch stop material containing silicon, oxygen and from 1% to 50% carbon with 20% being preferred, which reads on "from about 2% to about 20% carbon" (Abstract, col. 4, lines 18-63). The etch stop material provides good selectivity relative to non-carbon

Art Unit: 2813

containing dielectric materials such as silicon dioxide or doped silicon oxide (col. 12, lines 1-38; Figs. 8A to 8F).

It would have been obvious to one of ordinary skill at the time of the invention to use the silicon, oxygen and 20% carbon content taught by **Yau** in the sidewall spacers of **AAPA** in view of **McAnally** because (1) **McAnally** suggests using a carbon-rich oxide as the etchstop/sidewall material and (2) **Yau** teaches a specific “carbon-rich oxide” containing silicon, oxygen, and “preferably about 20%” carbon by weight, which also gives good etch selectivity between the etch stop and the same overlying insulating material in each of **AAPA**, **McAnally**, and **Yau**. Note that the overlying insulating material in each of **AAPA** (item 34 in prior art Fig. 1), **McAnally** (item 112 in Figs. 1C-1E) and **Yau** (items 510 and 518 in Figs. 8E-8F) is, *inter alia*, a silicon dioxide or doped silicon dioxide. (See instant application p. 4, lines 8-9; **McAnally** col. 3, lines 52-59; and **Yau** col. 12, lines 12-13.) Accordingly, a reasonable expectation of success exists for the use of the carbon-doped silicon oxide material in the **AAPA** structure, since each of **McAnally** and **Yau** teaches that the carbon-containing material is an etch stop relative to silicon oxide and doped silicon oxide. Moreover, **McAnally** teaches the carbon-doped silicon oxide material is used as an etch stop for exactly the same purpose as that disclosed in the instant specification: to provide protection to the gate electrodes during etching of the node contact in the silicon oxide interlayer dielectric. **McAnally** is silent to the quantity of carbon, such that one of ordinary skill would be especially motivated to apply the teaching of **Yau**, since **Yau** teaches the appropriate amount of carbon (about 20% by weight) to gain etch selectivity relative to the overlying silicon oxide.

Further in this regard, although the carbon quantity is not exactly as claimed by Applicant, overlapping ranges are *prima facie* obvious in the absence of unexpected results. (See MPEP 2144.05.) In this case, there exists no unexpected result. Rather the result indicated in the instant specification is exactly the same as in each of **McAnally** and **Yau**: etch selectivity is provided by adding carbon to the silicon dioxide etch stop and/or the sidewall spacers which enables protection of the gate electrode during etching of the node contact.

Regarding claim 97, **AAPA** and **McAnally** do not teach that the sidewall spacers have a thickness of less than about 500 Å. However, **McAnally** further indicates that a success of the invention is that “the invention allows for maximizing the area on the substrate that is in contact with a self-aligned contact” and that “the large contact area reduces the contact resistance and therefore increases the performance of the semiconductor device.” (See col. 2, lines 18-27.) And more pertinently, **McAnally** states, “Thus the use of an appropriate material for stopping layer 110 may allow the use of thinner films for the insulating film 106 and *the sidewall [spacers] 108*, which increases contact area and improves planarity.” (See col. 4, lines 42-45; Italicized emphasis added.) **McAnally** explicitly suggests minimizing the width of the sidewall spacers 108 which directly affect the contact area. The greater etch selective materials enable narrower or thinner sidewall spacers and etch stops because, as indicated in **McAnally**, the etch selectivity is greater between the carbon-containing materials and the non-carbon-containing materials. Accordingly, it would have been obvious for one of ordinary skill in the art, at the time of the invention to choose a sidewall spacer width of less than 500 Å in order to increase the contact area in accord with the **McAnally** invention and to thereby provide greater contact area in the

AAPA contact. (Compare this with the instant specification paragraphs bridging pages 14-15 and 22-23, which conveys virtually the same concept as McAnally.)

Furthermore, the selection of the sidewall spacer thickness is *prima facie* obvious because it is a matter of determining optimum process condition by routine experimentation with a single variable, i.e. the thickness of the sidewall spacers within the implicit suggestion of **McAnally** which indicates that carbon-containing sidewall spacers and etch stops are more etch selective, which implicitly indicates that said materials can perform the same etch-prevention function with less of the material. (See MPEP 2144.05.)

Furthermore, as devices shrink, so do the dimensions of the features of each device according to Moore's Law. Accordingly, the choice of sidewall spacer thickness is merely a matter of routine optimization, as indicated above. Applicant has not recognized an advantage not already known in the art regarding the thickness of the spacers. In other words, one of ordinary skill would not continue to use sidewall spacers of a thickness used in a 1- μm rule, for devices in a 0.18- μm rule; instead, the size of all of the features, particularly the sidewall spacers, would be necessarily be scaled down.

It would have been obvious to one of ordinary skill at the time of the invention to choose the sidewall spacer thickness in the **AAPA** to be less than 500 Å, depending upon the size of the opening between the wordlines, in order to optimize the sidewalls relative to the device being formed, and for the reasons just indicated above.

Response to Arguments

6. Applicant's arguments filed 1 July 2004 have been fully considered but they are not persuasive.

Applicant argues that the rejection under 35 USC 112(1) is improper because Examiner improperly interpreted Applicant's arguments. Examiner respectfully disagrees that the arguments were misinterpreted. Examiner acknowledged the embodiment in Yau referred to by Applicant at col. 4, lines 41-44. Perhaps Applicant is unaware that an alkyl group contains carbon **and hydrogen**. Perhaps Applicant is unaware that many of the CVD precursors used by Applicant --admitted by Applicant to provide the carbon in the carbon-containing film-- contain **alkyl groups as the carbon source**. In this regard, the specification indicates the source of carbon is coming from alkyl groups of the precursors such as TEOS (tetra**ethyl**orthosilicate) and BTBAS (bis-**tertiary butyl** aminolsilane). In other words, Applicant's admits that the ethyl and *tert*-butyl groups are **alkyl** groups providing carbon for the carbon-containing film consisting essentially of silicon, oxygen, and 2%-20% carbon. Applicant cannot now argue --without evidence-- that Applicant's alkyl groups somehow provide only carbon while **avoiding** adding hydrogen, while the **Yau** alkyl groups, by contrast, **provide** both carbon and hydrogen. Accordingly, Examiner respectfully submits that a proper response to the existing rejection of the claims under 35 USC 112(1) --generated by Applicant's own admissions of record-- should include evidence that Applicant's precursors somehow omit hydrogen in the carbon-containing film. Why? Because Applicant has stated on the record that the **Yau** precursors **which contain alkyl groups**, lead to the claimed carbon-containing film **with hydrogen**, while the instant

Art Unit: 2813

precursors, **which also contain alkyl groups**, somehow do **not** introduce hydrogen.

Accordingly, the arguments are not persuasive in this regard.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Regarding the “consisting essentially of language” MPEP 2111.03 states,

“The transitional phrase “consisting essentially of” limits the scope of a claim to the specified materials or steps **“and those that do not materially affect the basic and novel characteristic(s)” of the claimed invention**. In *re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976) (emphasis in original) (Prior art hydraulic fluid required a dispersant which appellants argued was excluded from claims limited to a functional fluid “consisting essentially of” certain components. In finding the claims did not exclude the prior art dispersant, the court noted that appellants’ specification indicated the claimed composition can contain any well-known additive such as a dispersant, and there was no evidence that the presence of a dispersant would materially affect the basic and novel characteristic of the claimed invention. The prior art composition had the same basic and novel characteristic (increased oxidation resistance) as well as additional enhanced detergent and dispersant characteristics.). “A consisting essentially of” claim occupies a middle ground between closed claims that are written in a consisting of” format and fully open claims that are drafted in a comprising” format.” *PPG Industries v. Guardian Industries*, 156 F.3d 1351, 1354, 48 USPQ2d 1351, 1353-54 (Fed. Cir. 1998). See also *Atlas Powder v. E.I. duPont de Nemours & Co.*, 750 F.2d 1569, 224 USPQ 409 (Fed. Cir. 1984); *In re Janakirama-Rao*, 317 F.2d 951, 137 USPQ 893 (CCPA 1963); *Water Technologies Corp. vs. Calco, Ltd.*, 850 F.2d 660, 7 USPQ2d 1097 (Fed. Cir. 1988). For the purposes of searching for and applying prior art under 35 U.S.C. 102 and 103, absent a clear indication in the specification or claims of what the basic and novel characteristics actually are, “consisting essentially of” will be construed as equivalent to “comprising.” See, e.g., *PPG*, 156 F.3d at 1355, 48 USPQ2d at 1355 (“PPG could have defined the scope of the phrase consisting essentially of” for purposes of its patent by making clear in its specification what it regarded as constituting a material change in the basic and novel

characteristics of the invention.”). See also *In re Janakirama-Rao*, 317 F.2d 951, 954, 137 USPQ 893, 895-96 (CCPA 1963). If an applicant contends that additional steps or materials in the prior art are excluded by the recitation of “consisting essentially of,” **applicant has the burden of showing that the introduction of additional steps or components would materially change the characteristics of applicant’s invention.** *In re De Lajarte*, 337 F.2d 870, 143 USPQ 256 (CCPA 1964). See also *Ex parte Hoffman*, 12 USPQ2d 1061, 1063-64 (Bd. Pat. App. & Inter. 1989) (“Although consisting essentially of” is typically used and defined in the context of compositions of matter, we find nothing intrinsically wrong with the use of such language as a modifier of method steps... [rendering] the claim open only for the inclusion of steps which do not materially affect the basic and novel characteristics of the claimed method. To determine the steps included versus excluded the claim must be read in light of the specification. . . . [I]t is an applicant’s burden to establish that a step practiced in a prior art method is excluded from his claims by consisting essentially of” language.”).

In the instant case, Applicant fails to provide evidence that the hydrogen fails to exist in the carbon-containing film --much less that the presence of hydrogen “would materially change the characteristics of applicant’s invention” or “do not materially affect the basic and novel characteristic(s)” of the claimed invention,” as required by present.

For at least these reasons, Applicant's arguments are not persuasive.

Conclusion

7. All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114.

See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 571-272-1693. The examiner can normally be reached from 9:00 - 19:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2813

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Erik Kielin
Primary Examiner
March 18, 2005